

LIST OF MANDATORY SPARES

SI No	DESCRIPTION	UNIT	QUANTITY	
			CHARIKAR	DOSHI
A)	220/20KV Power transformer		(16MVA)	(16MVA)
1	Oil cooler pump with motor	Set	1	1
2	Buchholz relay complete with float and contacts (Main Tank)	Set	1	1
3	Local & Remote WTI complete with sensing device & contacts	Set	1	1
4	OTI complete with contacts & sensing device	Set	1	1
5	Pressure relief Device	No.	1	1
6	Magnetic oil level gauge	No.	1	1
7	Cooler fan with motor	No.	1	1
8	Starters, contactors, switches & relays for electrical control panels (one set for each type)	Set	1	1
9	Set of valves (complete set for one transformer)	Set	1	1
10	Fuses (one set for complete replacement for one Autotransformer)	Set	1	1
11	Stainless Steel Oil sampling bottles (One Litre Capacity)	Nos.	10	10
12	Oil storage tank along with complete accessories (15KL capacity)	Sets	1	1
13	Indicating lamps (one set for complete replacement for one Autotransformer)	Set	1	1
14	Aux Transformers for control of Cooler control cabinet & OLTC (if applicable)	Set	1	1
15	Breather Assembly (one of each type) for conservator and OLTC	Set	1	1
16	Remote tap position indicator	No.	1	1
17	Oil flow indicator with flow switch	No.	1	1
18	Oil surge relay for OLTC	No.	1	1
19	Bushings of each rating	Set	1	1
20	Spare transformer oil	kL	2	2
21	Terminal connectors	Set	1	1
22	Bushing CTs of each ratio	Set	1	1
B)	245 kV SF6 Circuit Breaker			
1	One pole complete with column and interrupter with MB and operating mechanism and without support structure	No.	1	1
2	SF6 Gas	Kg	40% of ordered quantity	40% of ordered quantity
3	Rubber gaskets, 'O' rings and seals (complete replacement for one pole)	Set	1	1
4	Trip coils with resistor(110 V operating Voltage)	Nos.	2	2
5	Closing coils with resistor(110 V operating Voltage)	Nos.	2	2
6	Terminal pad & connectors of each type	No.	1	1
7	Molecular filter for SF6 gas	Sets	2	2
8	Density/Pressure monitor for SF6 circuit	No.	1	1
9	Pressure switches complete for one CB.	Set	1	1
10	Operation Counter	No.	1	1
11	Fixed moving and arcing contacts including	No	1	1

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	insulating nozzles for one pole of CB			
12	Relays, Power contactors, switch fuse units, limit switches, push buttons, timers & MCB etc.(110 V operating Voltage)	Set	1 of each type	1 of each type
13	Closing Coil assembly	No	1	1
14	Trip Coil assembly	No	1	1
15	Support Insulator Stack	No	-	-
16	Set of Control Valves (of each type)	Set	1	1
17	Pressure switches (For one CB)	Set	1	1
18	Pressure gauges & Coupling device of each type	Set	1	1
19	Aux. contact assembly	set	1	1
20	Spring operated closing mechanism(If applicable)		-	-
a)	Closing Dashpot	Set	1	1
b)	Opening Dashpot	Set	1	1
c)	Closing Latch Gear	Set	1	1
d)	Opening Latch Gear	Set	1	1
21	Micro Filter set	Set	1	1
22	Micro switches for aux. contact assembly	Set	1	1
23	All types of coupling for SF6 gas	Set	1	1
24	Pipe length (Copper & Steel)	Set	1	1
	Pneumatic Operating mechanism (If Applicable)			
1	Complete Operating mechanism	No.	1	1
2	All types of Valves for Pneumatic Operating mechanism	Set	1	1
3	"O" rings, Gaskets & Seals for operating mechanism	Set	1	1
	Hydraulic Operating mechanism (If Applicable)			
1	Hydraulic Operating mechanism with drive Motor	No.	1	1
2	Pressure gauges for Hydraulic Operating Mechanism	Set	1	1
3	"O" rings, Gaskets & Seals for operating Mechanism	Set	1	1
4	All types of Valves for Hydraulic Operating mechanism	Set	1	1
5	Pressure Transducer	No.	1	1
6	Pressure switch for Hydraulic circuit	Set	1	1
7	Accumulator	No.	1	1
8	Hydraulic Oil		40% of ordered quantity	40% of ordered quantity
C 1)	245 kV Isolator			
1	One complete pole of Isolator including support insulator with 1 E/S with operating mechanism for main isolator and earth switch	No.	1	1
2	Copper contact fingers for female & male contacts of each type	No	1	1
3	Relays, power contactors, MCBs, switch fuses, push buttons and resistors for electrical control circuit as per approved schematic			
		Set	1	1

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D 1)	216 kV Surge Arrestor			
1	216kV Surge Arrestor complete	No	1	1
2	Surge Counters	No	3	3
D 2)	20 kV Surge Arrestor			
1	20kV Surge Arrestor complete	No	1	1
2	Surge Counters	No	3	3
E)	Control and Relay Panel			
I)	Control Panel Equipment Spare			
1	Ammeter with transducer	Nos.	2	2
2	Wattmeter with transducer	No.	1	1
3	Varmeter with transducer	No.	1	1
4	Voltmeter with transducer	Nos.	2	2
5	Voltmeter selector switch	No.	2	2
6	Control switch for breaker	No.	3	3
7	Control switch for isolator	Nos.	4	4
8	Semaphore for Earthswitch	Nos.	6	6
9	Red/Green/White indicating lamp (with complete assembly) (3 no. for each colour)	Set	1	1
10	Indication lamps	Nos.	5	5
11	Annunciations windows with necessary annunciation relay	Nos.	5	5
12	Push button	Nos.	10	10
13	Trip transfer switch	No.	2	2
14	Synchronising socket	No.	1	1
15	Synchronising selector switch (if applicable)	No.	1	1
16	MCB & HRC fuses used in C&R Panel	No	1 of each type	1 of each type
II)	Breaker Relay Panel Spares			
1	Breaker failure relay	No.	1	1
2	Trip circuit supervision relay	No.	1	1
3	Auto reclose relay with check Synchronising relay and dead line charging relay	Nos.	1	1
4	Self reset trip relay (110 V operating Voltage)	Nos.	1 no. of each type	1 no. of each type
5	Hand reset trip relay (110 V operating Voltage)	Nos.	1 no. of each type	1 no. of each type
6	Timer relay (110 V operating Voltage)	No.	1 no. of each type	1 no. of each type
7	DC supervision relays (110 V operating Voltage)	No.	1 no. of each type	1 no. of each type
8	Flag relays (110 V operating Voltage)	Nos.	1 no. of each type	1 no. of each type
9	Auxiliary relays (110 V operating Voltage)	Nos.	1 no. of each type	1 no. of each type
III)	Transformer Protection Panel Spares			
1.0	Transformer differential protection relay including all aux. CTs	No.	1	1
2.0	Restricted earth fault protection relay with non-linear resistor	No.	1	1
3.0	Back up protection relay directional O/C one phase & one phase E/F element	Set	1	1
4.0	Over Fluxing relay	No.	1	1
5.0	CVT selection relay	No.	1	1

6.0	Over load spare relay with timer	No.	1	1
IV) Line Protection Panel Spares				
1.0	Main 1 numerical distance relay (excluding external trip relays)	Nos.	1	1
2.0	Main -II numerical distance relay (excluding external trip relays)	Nos.	1	1
3.0	Disturbance recorder-comprising of evaluation & acquisition units (if stand alone)	Nos.	1	1
4.0	Distance to fault locator including mutual compensation units (if stand alone)	Nos.	1	1
V) Common Spares				
1.0	Power supply module for Bus bar protection	No	1	1
2.0	Metrosil (Non linear resistor) (1 no of each type)	Set	1	1
3.0	Inter -posing CT & PT (1 no of each type)	Set	1	1
4.0	Power supply & module of each type for event logger	Set	1	1
F) LT Switchgear				
1.0	Relays of each type	Set	1	1
2.0	CT, PT (each type)	Set	1	1
3.0	Switch, Push buttons, meters	Set	1	1
4.0	TPN switch/MCB/MCCB 1 No. of each rating	Set	1	1
G) Batteries				
	a) Dry and uncharged cells	Nos.	10	10
	b) Inter cell connectors	Nos.	10	10
	c) Terminal lugs	Nos.	5	5
	d) Cell filling plug	Nos.	10	10
	e) Float plug with float	Nos.	10	10
H) Battery Charger				
	Spares of Battery charger (220V) Float/Boost			
	a. Set of control cards (All PCB cards)	Set	1	1
	b. Set of relays	Set	1	1
	c. Set of contactor	Set	1	1
	d. Micro switches (If applicable)	Set	1	1
	e. Filter capacitor	Nos.	1	1
	f. Three phase full wave bridge rectifier (Thyristor/diode)	Nos.	1	1
	g. Set of wound resistor (If applicable)	Set	1	1
	h. Set of switches	Set	1	1
	i. Potentiometer	No.	1	1
	j. Fuses of thyristor with indicator	Nos.	6	6
I) DG Set				
1	Element L.O. filter	No	1	1
2	Element L.O. bypass filter	No	1	1
3	Element fuel filter	No	1	1
4	Screen filter for fuel pump	No	1	1
5	Coil assembly 24 V	No	1	1
6	Solenoid coil for fuel oil system	No	1	1
7	Voltage regulator complete (AVR)	No	1	1
8	Switches	Set	1	1
9	Power contactors	Set	1	1
10	Auxiliary contactors	Set	1	1
11	Auxiliary relays	Set	1	1
12	Timers	Set	1	1
13	D.C. starter assembly with clutch engaging and disengaging arrangements complete with motor	No	1	1
14	Coil for the contactors (for both power and aux	No	1	1

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	contactors)			
15	Lub oil pressure safety control	No	1	1
16	High water temperature safety control	No	1	1
17	Diode	No	1	1
J)	LT Transformer			
a)	Bushing with metal parts (1 no. of each voltage rating)	Set	1	1
b)	Oil temperature indicator	Set	1	1
c)	diaphragm for pressure relief vent	Set	1	1
d)	Tap changer contacts	Set	1	1
OPGW Cable & Communication Equipments				
A	OPGW cable			
	24 Fibre (DWSM) OPGW fibre optic cable	Km.	1	-
B	OPGW cable Accessories			
	Installation Hardware set for 12 Fibre (DWSM) OPGW Fibre Optic cable consisting of following:			
1	Suspension assembly	Nos.	-	-
2	Tension assembly			
	a) At dead end location	Nos.	1	-
	b) At Pass through location	Nos.	1	-
	c) At joint box location	Nos.	1	-
3	Splice enclosures	Nos.	1	1
C	Underground Fibre Optic approach cable			
a)	24 Fibre (DWSM)	Km	0.5	0.5
D	Installation hardware set including ties/clips/cleats, conduits, ducts, supports, fittings, accessories etc for			
a	24 Fibre (DWSM) approach cable	Set**	0.5	0.5
NOTE**: One set of installation hardware shall contain all installation hardware fittings as may be required for 1 km fibre optic approach cabling.				
A	SDH Equipment			
	(I) Common cards, Power supply cards, hardware & accessories (each)	Set	1	1
	(II) Optical Cards			
	(a) L 1.2	No.	1	1
	(III) Tributary Cards			
	a) E1 Interface card (Minimum 4 interfaces per card card)	No.	1	1
	(b) Ethernet interfaces 10 Base T with Layer-2 switching (Minimum 4 interfaces per card.)	No.	1	1
B	Multiplexer			
	(i) Drop-Insert: Fully Equipped excluding subscriber line interface cards	No.	1	1
	(ii) Subscriber line interface cards			
	a) Voice channel cards: 2 wire	No.	1	1
	b) Voice channel cards: 4 wire (E&M)	No.	1	1
	c) Synchronous data cards (64 kbps)	No.	1	1
C	Pre- connectorized optical fibre Patch cords - pack of 6 patch cords of 10 meter each	Pack	1	1

M) Erection Hardware Item

5% spares of the actual Quantities for disc insulator, hardwares, clamps & connectors, spacers, corona bell, AL tube, welding sleeves etc at each station. No spares are to be

considered for conductor, BMB, grounding conductors, cable tray, Pipes (GI/PVC/hume), buried cable trenches, angles, channels, Junction boxes.

N) Spares for illumination system

5% of each type of lighting fixture supplied at each station